

the time at which the ovum was in the best condition to be fertilized remained to be proved. The knowledge that my twin girl was conceived two days after the cessation of the period furnished me with a premise for my conclusion, the soundness of which I proceeded to demonstrate by experiment. I had two sons after the birth of the twins conceived respectively on the fourth and fifth day after the cessation of the period. It was not until after the last birth that I persuaded other women to try the method.

The first experiment was tried by a woman who was very delicate and who would not, except in the hope of a son, have jeopardized her life again. Conception took place four days after the cessation of menstruation and her boy was born nine months later. She in her turn passed on the method to a friend, who also had a son. Another instance was that of a girl conceived a day after cessation of menstruation. It was stillborn, but the mother succeeded the next year in having a daughter. Another mother tried month after month for nearly a year, allowing no other possibility, and at last succeeded in having a daughter; some three years later she had another daughter, conceived one day before the period; this was not by intention, but she had grown into the habit of keeping dates and knew when conception took place.

Of boys conceived by intention I have numerous instances. One case is particularly interesting, where five daughters preceded and where the history of the family pointed to a dearth of sons; conception took place five days after cessation of menstruation, and a boy was born in due time, followed by another boy conceived by intention. Perhaps the most interesting case is the following: A woman married late in life, between thirty-five and forty; her husband was most anxious to have a son to inherit his property. The wife asked my advice, which she followed for two years, having no result; she then came to see me. I advised her to give up the hope of a son, and take her chance of either son or daughter, as I felt she was perhaps losing the hope of children at all, but she persisted; so I asked her to see a doctor, which I believe she did; she had a son within the year, who died at birth; the next year she had another son, and has now a daughter who was conceived by intention two days after the cessation of menstruation.

I could mention many more such cases. Of evidence deduced from women's experience, I have gathered a great deal. One mother who found that she could not afford a larger family tried to retard her responsibilities by putting off marital relations as long as possible after menstruation, the result being that all her late children were sons; one girl followed late in life conceived one day before the period. I know of several instances of children being born three weeks later than they were expected, being in each case girls.

I have noticed that where no undue interference takes place in domestic relations, where life is even, and the head of the house always at home, that daughters preponderate, the inference being that ordinary relations are resumed after cessation of menstruation; on the other hand, sailors, surveyors,

and such men whose home life is resumed at uncertain intervals, have generally more sons than daughters; again I have noticed that women who are naturally prudes have more sons than daughters; on the other hand, that women having warm natures, or who have been trained like the women of the European royal families to a subservient marital attitude, have more daughters than sons.

My own observation in the animal kingdom has led me to the same conclusion. We have had during fifteen years three generations of Shorthorn cows, and in all cases we have found heifer calves result when the animal's needs have been attended to immediately. Then again in the fowl yard I have found that a hen's first set of eggs produced a majority of females. It has nothing to do with the age of the hen herself. It is the first set of the season in which the female preponderates.

There are, of course, exceptions to all rules, but they lie, I feel sure, at all events in the human species, in abnormal conditions, where peculiar formation tends towards the retention of the ovum and conception takes place long after menstruation, or where the monthly period may not be reckoned by dates, in which case no plans can be laid; or where menstruation is absent, too profuse, or of too long continuance.

* Of the results of fertilization the third day after the cessation of the period I can give no opinion, not having obtained any evidence.

† If fertilization take place from five to three days before the period a male results, and in that case menstruation demonstrates itself and the child appears to be born before its time; but if fertilization take place just before the period, say from two to one days, a female results, and menstruation does not generally demonstrate itself, and the birth takes place three weeks later than it was expected. The count should be taken from the date of conception, whereas women count it from the cessation of the period; hence if a male is conceived days before the period, which for some unknown reason demonstrates itself in this case, he is born at a corresponding time, but the mother has counted from the cessation of the period and is out some eight days or so; whereas if conception takes place immediately before the period a female results, but for some reason menstruation does not in that case appear and the mother counts from the cessation of the previous period and thinks she has had to wait some three weeks over her time. I cannot account for these phenomena unless one may reason, that if conception takes place immediately before the period that the ovum being then in its most perfect condition nature is satisfied, and the internal mouth of the uterus is closed; whereas if conception takes place some days before the fullest development of the ovum, the ordinary processes continue because the most perfect state of the ovum has not been accomplished although conception has taken place. This is only surmise on my part, but of the phenomena I have had evidence.

THE SENILE SKIN.*

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Old age need not be defined, its significance becomes known to all objectively at a very early period and it is experienced subjectively by the majority sooner or later. To the adage, "A man is as old as his arteries," might often be added "and as old also as his skin,"—for various changes indicative of senility appear early in the skin where they can be plainly observed. That these senile changes are seen earlier in some than in others is a fact of common knowledge,—habits, environment and to some extent hereditary tendencies determining the same. The average person attains the position where he can avail himself of many of the luxuries of life at the period in his physical development when he can

* Read before the Alameda County Medical Society, March 21, 1911, and the Sonoma County Medical Society, April 7, 1911.

least afford to indulge himself much without paying Nature's penalties sooner or later. At the same time he can also avail himself of many comforts that go to make life easier and can take better care of himself. But with the means there is not usually the inclination to do the sensible thing and such is human nature that overindulgence is more apt to become the rule. Continued overindulgences of various sorts are prime factors in hastening the various senile or degenerative changes and are effective in inverse proportion to the constitutional resistance of the individual. Thus various excesses (in particular alimentary) are very prone to bring about or aggravate that common condition known as seborrhea, which forms a basis for so many degenerative conditions of the skin in later life, and that this will occur the earlier in the weaker members of the human family goes without saying. Said weaker members are brought into that susceptible class either by early excesses or hereditary tendencies. However, the average man does not succumb to these influences until about the age of fifty and the woman at the climacteric, when the period of senescence may be said to have begun. At this time there begins a very slow progressive waning of the various functions with degeneration and atrophy of the tissues.

Forces which in earlier life produced no apparent effects begin to do so at this time. Among the most potent of these forces are the sun's rays, heat, cold, wind and dust. Toxins from the gastrointestinal tract undoubtedly have a very great deal to do in contributing to the producing of these changes. These effects, of course, are most pronounced on the exposed parts, as the face, neck and dorsal surfaces of the hands, where changes indicative of senility first become very apparent.

The characteristic senile skin is relatively thin, dry and often scaly, inelastic, wrinkled and furrowed and of a yellowish color; the areas that normally have much pigment now show an increase,—these areas being especially the face, dorsum of hands, nipples, genitalia, region of the anus and lower extremities (the increased pigmentation occurring in variously sized macules or in large patches); the hair may fall out, "regress to the lanugo type" (Jackson) and lose its pigment; there may appear, especially on the parts exposed to the elements, small brownish, greasy crusts, pea sized or somewhat larger, usually very slightly adherent, but often warty and firmly attached; the subcutaneous fat often atrophies, which makes the increased thinness of the skin all the more apparent. Telangiectases are very prone to develop. Senile keratoses and other lesions appear. These will be discussed later.

These various features are based on the following histological appearances: The main part of the process consists of atrophy and drying of the prickle cell layers and increased development of the pigment in the basal layer. In the corium are seen various forms of degeneration of the collagen and the elastic fibers. Fat cells are much diminished in amount and the subcutaneous fat is usually very much reduced. The sebaceous and coil glands are dilated and often have their ducts full of debris. Some of

the blood vessels are dilated and others have thickened walls or they are obliterated. The hair follicles are often shorter. The whole process is one of atrophy in which all of the structures in the skin participate more or less, the epidermis and corium often being so thin that rete pegs and papillae are not to be seen.

Pruritus Senilis is a common condition or rather a symptom which often causes great discomfort and even suffering. The only objective signs that may be present are increased pigmentation and excoriations or later local thickening, caused by scratching. In the pruritus that often goes under this name there can usually be found some underlying cause such as digestive disturbance or some liver, kidney, arthritic or circulatory disorder with associated defects of metabolism or elimination so common in those past middle life. The writer has frequently been able to find an intestinal indigestion or renal insufficiency and several times lately a condition of hypothyroidism as causative factors, all of which go to illustrate the fact that in the dry atrophic skin of old age a pruritus is very prone to develop. Aside from all this, however, there is a senile pruritus proper which is due primarily to the atrophic and degenerative changes in the senile skin.

Alopecia senilis may occur at any time after the forty-fifth year and is due to the progressive atrophy of the scalp which develops along with the atrophy of the rest of the skin. The smooth, shiny, oily and often tight appearance of such a scalp are all indicative of atrophy. Senile alopecia is symmetrical, usually begins over the vertex and gradually spreads mostly in an antero-posterior direction. The various types of baldness of age are so familiar that further description is unnecessary. The condition may follow graying of the hair or may accompany it. As the hair follicles all over the body become more or less atrophied, this thinning of the hair may become very pronounced in various parts of the body as well as on the scalp.

A very common condition seen on the senile skin, particularly on the hands and face, is that called *Keratoses senilis*. The lesions consist of flattened, more or less scaly, rough, slightly raised patches, yellowish or blackish in color, often greasy and varying in size from that of a pea to a finger nail or larger. They may consist merely of dry, adherent scales made up of cornified cells. They may occur also on the forearms, legs, genitals and rarely the feet. These lesions are serious enough to warrant prompt attention because of the fact that they are on the borderland, so to speak, of epithelioma. In fact, at times it is very difficult to determine where the one ends and the other begins. They are usually very indolent and may persist for years without any subjective symptoms. As the lesion grows older it shows a tendency to become thicker and often there is some irritation around its base. Frequently these lesions are surrounded by telangiectases. They are very prone to become epitheliomatous when aggravated and often various stages may be seen on the same person in close relationship to one another, for example a simple keratosis, an irritated keratosis and epithelioma. Some individuals show this tendency to develop epitheliomata more than others.

Sometimes it appears to be a family trait. While it is usually a condition of old age, it may occur earlier in life. It is more apt to develop on a seborrheic skin,—in fact it can be considered as one of the late complications of seborrhea. Exposure to the elements, more particularly wind and irritating dust may be exciting causes. Histologically one finds great thickening of the stratum corneum with retention of the nuclei of the cells. This process extends into the mouths of the sweat glands and hair follicles which are often further obstructed by horny plugs. Hartzell found that the stratum granulosum had largely disappeared excepting around the openings of the coil gland ducts and the hair follicle openings. A condition very closely approaching that of epithelioma is seen in the older lesions. Sometimes the sweat gland ducts are obliterated by the proliferation of the lining epithelium and cystic formations occur in them, or there may be simple dilatation. Cellular infiltration is frequently seen around the glands. The usual other histologic appearances of senile skin are also present.

The *Cutaneous Horn* is another of the complications of senile skin. It is really a miniature horn and is firmly attached to a basal process that often shows irritation and beginning epithelioma, especially if of long standing. They vary in size from a fraction of an inch to several inches in length (some have been reported fourteen inches long). They are usually single but there may be more than one. They are found on the scalp, temples, forehead, nose, lower extremities and the male genitals and trunk. Usually they arise from a senile wart, but they may also originate from a sebaceous cyst.

By far the most serious complication of the condition under consideration is *Epithelioma* which may be defined briefly as carcinoma beginning in the epithelial structures of the skin. These neoplasms appear as pearly nodules, vegetations or ulcers with raised, hard, waxy-looking borders, frequently with telangiectases extending over or around them. The picture is familiar to all. There are two great types, the *basal-cell* (the familiar rodent nodule or ulcer) and the *prickle* or *squamous-cell* epithelioma. The *rodent* is usually superficial and relatively benign, but it may become invasive and destructive. It is made up of cells originating in the basal layer of the epidermis and its direct connection with the epidermis can be demonstrated. The *squamous-cell* epithelioma is a more serious affair. It is composed of prickle cells of the type seen in the middle stratum of the epidermis and shows a decided tendency to invade deeply, to metastasize and involve the lymph glands. In these solid masses of prickle cells the familiar horny pearls made up of cornified cells arranged in concentric whirls are seen in large numbers. It is on the seborrheic skin that these neoplasms are very prone to develop and any of the various lesions of senile skin already mentioned can form the basis of the same. The occurrence of these pre-epitheliomatous conditions and their gradual development into epithelioma when irritated for any length of time furnishes an exception to the rule

advocated by adherents of the Cohnheim theory which assumes that "cell rests" form the basis of the various neoplasms. As Fordyce has observed, "the weight of evidence in the majority of cutaneous neoplasms is not in favor of the embryonal cell rest theory." Of the various factors that can stimulate the epidermal cells to an abnormal degree, are microorganisms and their toxins for example: large fungating masses caused by a chronic staphylococcus infection, tuberculosis verrucosa caused by the tubercle bacillus, marked hyperplasia due to the presence of the organism between the epithelial cells in yaws, granulations and acanthosis in blastomycosis, condylomata and leucoplakia in syphilis, and also chemical substances such as tar and its derivatives, paraffine, arsenic, tobacco, scarlet red and the various light rays. It is interesting to relate that indol, skatol and other products of intestinal fermentation, injected into the ear of rabbits by Stoker and Wacker (quoted by Fordyce) brought about a condition very much like carcinoma. Adami observes that so long as a cell is engaged in the performance of its function it uses up its energy and cannot at the same time conserve energy for proliferation, but with a disturbance or interference with its function conditions are changed and the vegetative powers of the cell gain the ascendant. "Skin cancers afford much evidence that they start from degenerated epithelial cells as in leucoplakias, keratoses, degenerations brought about by light (solar and X-ray) and chronic inflammatory processes" (Fordyce). This phase of the subject cannot be further discussed here because it would involve so many considerations that it would lead us far afield, and time forbids. Suffice it then to observe that epithelioma is a disease of middle life or old age and that the various lesions and degenerations found in the senile skin are potentially precancerous conditions which only require the proper stimulation to start them on their destructive course. Of these various states senile keratosis is the most important and therefore calls for early radical treatment.

Treatment. Toward remedying established senility, of course nothing can be done (at present old age is an incurable disease) but, as every one knows, prophylaxis in the form of rational hygienic living begun in early life and carried through all the years will postpone the state of senescence.

To keep this paper within due bounds, the writer will limit his account of the special treatment of these various conditions to a consideration of some few measures which he has personally observed to be effective. That proper care of the skin and hygienic living in the effort to keep all the tissues of the body in a proper state of nutrition, and the reasonable protection from the deleterious effects of the elements will postpone the onset of these lesions is so evident that it is hardly necessary to mention the fact. Even in middle life when senile changes appear to be imminent the nutrition of the skin may be improved by salt and bran baths, massage, oil inunctions, exercise and electricity. *Senile pruritus*, that is, pruritus in the aged due to no discoverable cause is often exceedingly obstinate. There are many remedies recom-

mended for the relief of the condition. A two per cent. salicylic acid ointment has been found very useful. Also a ten per cent. solution of Spiritus mentha pip. in glycerin and water (equal parts), has often proven valuable in the writer's service. In some of the aged patients with dry skin the writer has successfully given thyroid substance in 12 centigram doses (*the patients being kept under the watchful eye of the nurse while taking the drug*). Electricity, and hot and cold douches in some cases requiring stimulation have proven useful. In simple cases the supplying of the deficient oil of the senile skin by daily inunctions with olive oil or some simple thin ointment has relieved the condition. In all of these cases by improving intestinal and renal elimination and also by relieving any intestinal fermentation the other treatment is greatly aided. There is a long list of antipruritics from alcohol to zinc, but the writer has found the foregoing of special value.

Rosacea and simple telangiectasis when established call for destructive measures for their relief, of which electrolysis carefully performed is one of the best.

Alopecia senilis of course cannot be cured when once established but its onset can be delayed or even prevented by early attention. Prophylaxis should begin in infancy and continue through life. The persistent treating of any existing seborrhea capitis is of course of extreme importance.

Keratosis senilis is best prevented by treating early any seborrhea but when it becomes well developed it is most readily removed by simple curetting and then cauterizing the base of the lesion. Trichloroacetic acid crystals are very efficacious when applied for this purpose. In the simple forms of this condition an ointment containing from 4 grams to 16 grams of sulphur in 32 grams of vaseline or cold cream rubbed in twice daily after first washing with hot water and soap will usually remove the lesions. If the lesion is very thick salicylic acid (1 to 5%) may be added to this ointment. Those which this ointment will not remove can be permanently destroyed by the curette and caustic already mentioned and the resulting scar will be faintly marked. The X-rays will cause rapid subsidence of these keratoses. In the sun's light there are actinic rays which have much to do with the producing of senile keratosis and superficial epithelioma. These effects are brought about through irritation. Irritation if carried a few degrees further in the case of degenerating cells results in destruction and so the sun's rays can be utilized. By concentrating these rays through a lens on keratosis senilis for prolonged periods the same can be caused to disappear. The writer has made use of this fact recently in treating keratoses on a patient ninety years' old.

The writer has had a patient with psoriasis expose some of his lesions to the direct strong sunlight for an hour or two daily for a week and the area thus treated has promptly cleared up. These actinic light rays were utilized by Finsen in his successful treatment of lupus vulgaris. In this connection the fact that lupus vulgaris is compara-

tively rare in sunny Hawaii, and California and other sunny climes suggests the interesting theory that perhaps the actinic rays of the sun may be important factors here.

Epithelioma in every case demands thorough treatment, the earlier the better. This treatment will be outlined as briefly as possible. In the first place it is of the utmost importance to diagnose the type of the disease. This is accomplished by a biopsy and microscopic examination. The squamous cell type is more malignant and involves the glands sooner or later unless properly treated, so from the earliest a radical operation going well outside the lesion and taking in all the involved glands is decidedly indicated. In the small early lesion before the glands are affected, thorough scraping followed by cauterization with a good caustic paste will often suffice, but it is of vital importance to make sure that there are no involved glands. The X-ray is useful here also, but with this type nothing short of radical destruction can be considered ideal, and this is best accomplished with the knife. The writer is well aware that caustic pastes are used, but in his opinion it is not a safe method. The basal cell type or "rodent" nodule or ulcer calls usually for milder although thorough measures. There being no glandular complications the various caustic pastes are useful, but destruction is best accomplished by thorough preliminary use of the knife or curette. It is surprising how readily this type can be curetted and with what little pain. In the writer's experience this has proven the most useful method for this variety of epithelioma but it is of the greatest importance to make it thorough. A proper course of X-ray treatment after this will ensure the destruction of any remaining epitheliomatous cells. After the curetting pure chromic acid crystals can be applied to the surface so as to completely cover the same. The hemorrhage should first be reduced (pressure is usually effective). The chromic acid forms a black crust which can be allowed to remain until ready to come off. There is some reaction in the surrounding tissues following this, or any other caustic treatment, but it soon subsides. It is believed that this inflammatory reaction causes the destruction of any of the epithelioma cells that may remain after curettage. In the milder cases the pure trichloroacetic acid crystals may be applied. The arsenic paste as well as the various other caustic pastes prove very effective in the simpler cases, the arsenic particularly seeming to have a selective action. Many other methods of treatment including the use of radium, high frequency spark, cathaphoresis, phototherapy, static electricity, liquid air and carbon dioxide snow will not be discussed here because it would prolong the paper unnecessarily. In fact the writer has merely given prominence to the various measures which in his experience and observation have proven most effective in the relief of these various conditions.

The purpose of this paper has been to emphasize the significance of various lesions in the senile skin and above all the utility of early, thorough treatment in preventing some of the ills of the period of senescence.